

# CROSS CONNECTIONS

## An Informational Guide

As a community within the Commonwealth, the Town of Stoneham was mandated, by way of Massachusetts drinking water regulations, to help maintain the integrity of our water system by checking for, eliminating, and/or protecting cross connections.

As a business owner, you must protect your drinking water system and the health of your employees, customers and neighbors by preventing or protecting all cross connections on your premises. As a resident, you should understand what a cross connection is, the potential hazard such a connection represents, and the steps needed to maintain the integrity of the water system you rely on everyday.

### *What is a cross connection?*

A cross connection occurs whenever a potable drinking line is directly or indirectly connected to a non potable piece of equipment or piping. Examples of non potable equipment in your facility may include fire protection, lawn irrigation, air conditioning or cooling systems, as well high pressure boilers. In a factory, cross connections may also occur within processing equipment such as chemical mixing tanks, plating tanks, and heat exchangers.

### *Why should I be concerned about cross connections?*

An unprotected or inadequately protected cross connection on your premises could contaminate the drinking water not only in your facility, but in neighboring businesses and homes.

Severe illnesses – even death – have been caused by cross connection contamination events that could have been prevented. Unprotected and inadequately protected cross connections have been known to cause outbreaks of hepatitis A, gastroenteritis, Legionnaire's disease, chemical poisoning, body lesions (from exposure through showering), damage to plumbing fixtures, and explosions.

### *How are cross connection hazards prevented?*

Cross connection hazards are prevented by installing and maintaining valves, known as backflow prevention devices or by eliminating the cross connection entirely.

### *What is my responsibility as a facility owner?*

Your facility must be surveyed to determine if any cross connections exist. You, as the facility owner are responsible for taking corrective action to eliminate cross connections or to install appropriate backflow prevention devices. In every case, each cross connection must be eliminated or properly protected by a backflow device. All work done on the internal plumbing system of your facility must be performed by a Massachusetts licensed plumber. Any changes to your plumbing must be approved by your local plumbing inspector and public water supplier as necessary.

### *How can a cross connection incident occur?*

Nonpotable water or chemicals used in a system or equipment can end up in the drinking water line as a result of backpressure or backsiphonage. Backpressure occurs when the pressure in the equipment or system (e.g., air conditioning system, boiler, etc.) is greater than the pressure in the drinking water line. Backsiphonage occurs when the pressure in the drinking water line drops (due to fairly routine occurrences such as water main breaks, fires, heavy demand, etc.) and contaminants are sucked out of the system and into the drinking water line.

### *What are the regulations governing cross connections?*

The Massachusetts Plumbing Code (248CMR 2.14) and Massachusetts Drinking Water Regulations (310 CMR 22.22) both require the installation of backflow preventers at all cross connections. Several types of devices are available: reduced pressure backflow preventers (RPs), double check valve assemblies (DCVAs), air gap separations with tank and pump arrangements, atmospheric vacuum breakers (AVBs), pressure vacuum breakers (PVBs), and barometric loops. The type of device that is appropriate for your application depends on the degree of hazard associated with the particular cross connection. All backflow preventers require a local plumbing permit. Some devices – RPs, DCVAs and air gaps – also must be approved by DEP or its designee before they are installed. The DEP permit must be renewed every year.

State regulations also require periodic testing of RPs, air gaps, and DCVAs to ensure that they are continuing to work properly. RPs and air gaps must be tested twice annually by the water supplier.

### *Where can I go for more information?*

Please contact the DEP, Division of Water Supply, at (617) 292-5500 or [www.mass.gov/dep/dw](http://www.mass.gov/dep/dw), or Gabriella Rus-Neacsu of Sigma Water Safety, Inc., at 800-381-7156 for further information.